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(54) VEHICLE INTERIOR TRIM COMPONENT WITH A HINGE ASSEMBLY

VERKLEIDUNGSTEIL EINES FAHRZEUGINNENRAUMS MIT SCHARNIERANORDNUNG

COMPOSANT DE GARNITURE D'INTÉRIEUR DE VÉHICULE AVEC ENSEMBLE DE CHARNIÈRE

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Description

CROSS REFERENCE TO RELATED APPLICATION

[0001] This application claims priority from and the benefit of U.S. Provisional Application Serial No. 61/347,099, entitled "HINGE ASSEMBLY FOR VEHICLE INTERIOR TRIM COMPONENT", filed May 21, 2010.

BACKGROUND

[0002] The invention relates generally to a vehicle interior trim component with a hinge assembly.

[0003] Many vehicles have a central floor console located between the driver seat and the front passenger seat. In most cases, the floor console extends from below the front dash toward the second row of seating and may include an armrest for the driver and/or front passenger. These floor consoles have been used in vehicles for many years and can vary quite significantly, depending on the type and make of the vehicle. However, a common aspect of many of these floor consoles is the inclusion of a designed storage space.

[0004] Certain floor console armrests are configured to rotate about a lateral axis of the vehicle interior to expose a storage compartment underneath the armrest. For example, an occupant may rotate the armrest upwardly to access items within the storage compartment. In certain configurations, a hinge assembly facilitates rotation of the armrest with respect to the floor console while providing resistance to rotation. Certain hinge assemblies include a steel shaft with spring clips disposed about the shaft. Friction between the spring clips and the shaft establishes a desired resistance to armrest rotation. Unfortunately, because the shaft and spring clips are machined from steel, such hinge assemblies are expensive to manufacture. In addition, the steel elements may increase vehicle weight, thereby reducing fuel efficiency. Furthermore, adjusting the hinge assembly to achieve a desired level of resistance may be a complex and time-consuming process, thereby further increasing manufacturing costs.

[0005] DE 102 23 460 A1 discloses a hinge for doors, flaps or seats in vehicles comprising a lug part and a pin part having a hinge pin which can be inserted into a hinge lug formed as a sleeve.

[0006] US 5,165,145 A describes a hinge mechanism which is suitable for use on a pivotable character display for an electronic typewriter or portable computer.

[0007] US 2004/0074050 A1 describe a tilt hinge connecting a first member which constitutes a keyboard base and a second member which constitutes a display device of a small-sized office automation equipment, in which the first member and the second member are opened and closed with respect to each other.

[0008] US 6,033,015 A describes an armrest assembly with a hinge assembly according to the preamble of claim

1, comprising a bin defining a storage compartment and a cover hinged to the bin for movement between open and closed positions.

[0009] US 2006/0048337 A1 describes a hinge assembly including a main member having a main cam member and a bore extending generally along an axis of rotation.

BRIEF DESCRIPTION OF THE INVENTION

[0010] The present invention relates to a vehicle interior trim component according to claim 1.

[0011] The present invention further relates to a method of manufacturing a vehicle interior trim component hinge assembly including forming a torsion assembly by rotationally coupling a first friction disk to a shaft, disposing a second friction disk about the shaft adjacent to the first friction disk, and biasing the first and second friction disks toward one another to establish a friction force. The method also includes disposing the torsion assembly within a passage of a rotatable component such that an outer protrusion of the second friction disk engages a recess of the rotatable component to rotationally couple the second friction disk to the rotatable component. The friction force provides resistance to rotation of the rotatable component about the shaft.

DRAWINGS

[0012]

FIG. 1 is a perspective view of an exemplary vehicle that may include a hinge assembly configured to provide resistance to rotation.

FIG. 2 is a perspective view of an exemplary floor console, as shown in FIG. 1, having an armrest with a hinge assembly configured to provide resistance to armrest rotation.

FIG. 3 is a perspective view of the floor console shown in FIG. 2, in which the armrest is rotated about an axis to expose a storage compartment within the floor console.

FIG. 4 is a perspective view of a hinge assembly which does not form part of the invention and that may be employed within the floor console of FIG. 2 to facilitate rotation of the armrest.

FIG. 5 is an exploded view of the hinge assembly, as shown in FIG. 4.

FIG. 6 is a cross-sectional view of the hinge assembly, taken along line 6-6 of FIG. 4.

FIG. 7 is a cross-sectional view of the hinge assembly, taken along line 7-7 of FIG. 4.

FIG. 8 is an exploded view of an embodiment of a detent assembly that may be employed within the hinge assembly of FIG. 4.

FIG. 9 is an exploded view of an embodiment of a hinge assembly according to the invention, having a torsion assembly configured to provide rotational resistance.

FIG. 10 is a cross-sectional view of the hinge assembly, as shown in FIG. 9.

DETAILED DESCRIPTION

[0013] FIG. 1 is a perspective view of a motor vehicle 10 including a floor console having a rotatable armrest. As illustrated, the vehicle 10 includes an interior 12 having a seat 14, and a floor console 16. As discussed in detail below, the floor console 16 includes an armrest having a hinge assembly configured to provide resistance to armrest rotation. In certain embodiments, the hinge assembly includes a shaft rigidly coupled to an armrest base, and a passage within an armrest lid. The shaft passes through the passage to facilitate rotation of the armrest lid relative to the armrest base. The hinge assembly also includes a first friction disk disposed about the shaft and including a first engagement feature configured to block rotation of the first friction disk relative to the shaft. Furthermore, the hinge assembly includes a second friction disk disposed about the shaft and including a second engagement feature configured to block rotation of the second friction disk relative to the passage. The hinge assembly also includes a biasing member configured to urge the first and second friction disks toward one another to establish a friction force that provides rotational resistance between the armrest lid and the armrest base. In such a configuration, rotation of the armrest in either an upward or downward direction is resisted by the friction force between disks.

[0014] Rotational resistance may be varied by adjusting the friction force between disks. For example, the number of first and second friction disks may be selected to achieve a desired level of rotational resistance. In addition, the biasing force, the radius of the first and second friction disks and/or the disk material may be chosen to attain a friction force sufficient to establish a desired rotational resistance. Because the shaft and friction disks are constructed from light-weight plastic, the present hinge assembly may be lighter and less expensive to produce than hinge assemblies employing steel shafts and spring clips.

[0015] FIG. 2 is a perspective view of an exemplary floor console 16, as shown in FIG. 1, having an armrest with a hinge assembly configured to provide resistance to armrest rotation. As illustrated, the floor console 16 includes a body 18 enclosing one or more storage compartments. For example, the floor console 16 may include a storage compartment underneath the illustrated tambour door 20 and/or the armrest 22. As will be appreciated, the tambour door 20 may be configured to transition between the illustrated closed position to an open position that facilitates access to a storage compartment positioned at a front portion of the console 16. Similarly, as discussed in detail below, the armrest 22 may rotate to expose another storage compartment positioned at a rear portion of the console 16. In certain configurations, the two storage compartments may be connected such

that an occupant may access either storage compartment via the tambour door 20 or the armrest 22. It should be appreciated that alternative embodiments may include additional storage compartments positioned throughout the floor console 16.

[0016] As discussed in detail below, the armrest 22 includes a hinge assembly 24 configured to facilitate rotation of the armrest 22. In certain embodiments, the armrest 22 is configured to rotate upwardly in a direction 26 about a lateral axis 28 (e.g., an axis extending laterally along the vehicle interior 12). In such embodiments, rotation of the armrest 22 may expose an interior of a storage compartment disposed within the body 18. In the present embodiment, the hinge assembly 24 includes multiple friction disks configured to provide resistance to armrest rotation about the hinge assembly 24. Specifically, the hinge assembly 24 includes a shaft disposed through the armrest 22, and a first friction disk rotationally coupled to the shaft. The hinge assembly 24 also includes a second friction disk rotationally coupled to the armrest 22, and a biasing member configured to urge the first and second friction disks toward one another to establish a friction force that provides resistance to rotation of the armrest 22 about the shaft. Because the shaft and friction disks are composed of light-weight plastic, the hinge assembly 24 may be lighter and less expensive to produce than hinge assemblies including metal shafts and spring clips.

[0017] FIG. 3 is a perspective view of the floor console 16 shown in FIG. 2, in which the armrest 22 is rotated about the lateral axis 28 to expose a storage compartment 30 within the body 18 of the floor console 16. With the storage compartment open, the occupant may access items within the storage compartment 30 and/or place additional items within the compartment 30. As previously discussed, the storage compartment 30 may be linked to another storage compartment disposed beneath the tambour door 20 to enhance utility of the center console 16. The storage compartment 30 may be closed by rotating the armrest 22 downwardly in the direction 32.

[0018] FIG. 4 is a perspective view of a hinge assembly 24 that may be employed within the floor console of FIG. 2 to facilitate rotation of the armrest 22. As illustrated, the hinge assembly 24 includes a first structure, such as the illustrated armrest base 34, and a second structure, such as the illustrated armrest lid 36. In the present embodiment, an armrest profile 38 is coupled to the armrest lid 36, and configured to support components of the armrest 22, such as foam padding and/or an outer skin covering. As discussed in detail below, the hinge assembly 24 facilitates rotation of the armrest lid 36 relative to the armrest base 34 to enable the armrest 22 to rotate in the directions 26 and 32, as illustrated in FIGS. 2 and 3.

[0019] As illustrated, a shaft 40 extends through elements of the armrest base 34 and armrest lid 36 to facilitate rotation of the armrest 22. In the illustrated embodiment, the shaft 40 is a component of a pin 42. The pin 42 also includes a head 44 disposed at one end of the

shaft 40. The head 44 is keyed to the armrest base 34 to block rotation of the shaft 40 relative to the base 34. Specifically, the head 44 includes two openings 46 configured to interface with two corresponding protrusions 48 of the base 34. Because an outer diameter of each protrusion 48 is substantially similar to an inner diameter of each opening 46, contact between the protrusions 48 and the openings 46 substantially blocks rotation of the pin 42 relative to the armrest base 34. While two protrusions 48 and two openings 46 are utilized in the illustrated configuration, it should be appreciated that more of fewer protrusions 48 and openings 46 may be employed in alternative embodiments. In addition, further embodiments may incorporate alternative key assemblies to block rotation of the pin 42 relative to the base 34.

[0020] As illustrated, the shaft 40 of the pin 42 extends through a passage, such as the illustrated cavity 50, of the armrest lid 36. As discussed in detail below, the cavity 50 includes certain unique features configured to facilitate rotation of the armrest lid 36 about the shaft 40 while providing a resistance to rotational movement. The shaft 40 also extends through supports 52 coupled to the armrest lid 36 and supports 54 coupled to the armrest base 34. The shaft 40 and supports 52 and 54 serve to couple the armrest lid 36 to the armrest base 34, while enabling rotation of the armrest 22.

[0021] FIG. 5 is an exploded view of the hinge assembly 24, as shown in FIG. 4. As illustrated, each support 52 coupled to the armrest lid 36 includes an opening 56 configured to receive the shaft 40. Similarly, each support 54 coupled to the armrest base 34 includes an opening 58 configured to receive the shaft 40. Consequently, once the openings 56 and 58 are aligned, the shaft 40 of the pin 42 may be inserted through the supports 52 and 54, thereby coupling the armrest lid 36 to the armrest base 34 and enabling rotation of the armrest lid 36 relative to the base 34. In addition, once the pin 42 is inserted, the shaft 40 will extend into an interior 60 of the cavity 50. As discussed in detail below, the cavity 50 includes certain features configured to provide resistance to rotation of the armrest lid 36 about the shaft 40.

[0022] In the present embodiment, the cavity 50 contains friction disks configured to establish a friction force that provides resistance to rotation of the armrest lid 36. As illustrated, the armrest assembly 24 includes a first friction disk 62 disposed about a portion of the shaft 40 positioned within the cavity 50. The first friction disk 62 includes a first engagement feature configured to block rotation of the first friction disk 62 relative to the shaft 40. Specifically, the first friction disk 62 includes two inner protrusions 64 configured to engage two corresponding recesses 66 within the shaft 40. As will be appreciated, contact between the protrusions 64 and the recesses 66 will block rotation of the first friction disk 62 about the shaft 40. Consequently, an orientation of the first friction disk 62 will be fixed relative to the armrest base 34. While the illustrated first friction disk 62 includes two protrusions 64, it should be appreciated that alternative embodiments

may include more of fewer protrusions 64. For example, certain embodiments may include 1, 2, 3, 4, 5, 6, or more protrusions 64 and a corresponding number of recesses 66 within the shaft 40.

[0023] The armrest assembly 24 also includes a second friction disk 68 disposed about the portion of the shaft 40 positioned within the cavity 50. The second friction disk 68 includes a second engagement feature configured to block rotation of the second friction disk 68 relative to the cavity 50. Specifically, the second friction disk 68 includes two outer protrusions 70 configured to engage two corresponding recesses 72 within the interior 60 of the cavity 50. As will be appreciated, contact between the protrusions 70 and the recesses 72 will block rotation of the second friction disk 68 within the cavity 50. Consequently, an orientation of the second friction disk 68 will be fixed relative to the armrest lid 36. While the illustrated second friction disk 68 includes two protrusions 70, it should be appreciated that alternative embodiments may include more of fewer protrusions 70. For example, certain embodiments may include 1, 2, 3, 4, 5, 6, or more protrusions 70 and a corresponding number of recesses 72 within the cavity 50.

[0024] The hinge assembly 24 also includes a biasing member, such as the illustrated coil spring 74. In the present embodiment, the spring 74 is disposed about the shaft 40 and configured to apply a compression force to the second friction disk 68. As discussed in detail below, an end cap 76 is positioned adjacent to the opening of the cavity 50 and secured to the shaft 40. Consequently, the spring 74 pushes outwardly against the end cap 76 and the second friction disk 68, thereby urging the second friction disk 68 against the first friction disk 62. As a result, a friction force is established between disks 62 and 68 which provides resistance to rotation of the armrest lid 36. Specifically, because the first friction disk 62 is rotationally coupled to the shaft 40 and the second friction disk 68 is rotationally coupled to the armrest lid 36, rotation of the armrest lid 36 about the shaft 40 is resisted by friction between the disks 62 and 68 resulting from the axial force applied by the spring 74.

[0025] The magnitude of rotational resistance may be varied by adjusting certain parameters within the hinge assembly 24. For example, adjusting the coefficient of friction on the surface of each disk 62 and 68 will affect the friction force between disks, thereby resulting in increased or decreased rotational resistance. As will be appreciated, the coefficient of friction may be adjusted by varying the disk material and/or altering a surface finish of the disks 62 and 68. In addition, adjusting the diameter of the disks 62 and 68 will alter the contact area between disks, thereby varying the friction force. Furthermore, the force applied by the spring 74 may be increased to achieve a higher rotational resistance, or decreased to lower rotational resistance. As discussed in detail below, the number of first and second friction disks 62 and 68 employed within the hinge assembly 24 will also affect rotational resistance.

[0026] In certain embodiments, the number of disks 62 and 68, the spring force, the diameter of the disks 62 and 68 and/or the coefficient of friction between disks 62 and 68 may be selected during the manufacturing process to achieve a desired level of rotational resistance. For example, if a first rotational resistance is desired for a first armrest 22, and a second rotational resistance is desired for a second armrest 22, a different number of disks 62 and 68 may be employed within each hinge assembly 24. Otherwise, the hinge assemblies 24 may be substantially identical. Such a configuration may significantly reduce manufacturing costs by enabling a single hinge assembly 24 to provide varying degrees of rotational resistance. In addition, the pin 42 and/or the disks 62 and 68 are composed of plastic, thereby providing a lighter and less expensive hinge assembly than configurations utilizing metal shafts and spring clips.

[0027] FIG. 6 is a cross-sectional view of the hinge assembly 24, taken along line 6-6 of FIG. 4. As illustrated, the shaft 40 of the pin 42 passes through the openings 56 and 58 of the supports 52 and 54, thereby securing the armrest base 34 to the armrest lid 36, while facilitating rotation of the lid 36 relative to the base 34. In addition, the shaft 40 passes through the cavity 50 which contains friction disks 62 and 68 configured to increase rotational resistance of the armrest lid 36 about the shaft 40. As illustrated, protrusions 70 of the second friction disks 68 engage the recesses 72 of the cavity 50, thereby rotationally coupling the second friction disks 68 to the armrest lid 36. As discussed in detail below, the end cap 76 is also rotationally coupled to the armrest lid 36. Consequently, because the spring 74 is disposed against the end cap 76 and a second friction disk 68, the spring 74 will rotate with the armrest lid 36 without twisting.

[0028] In the present embodiment, the hinge assembly 24 includes six first friction disks 62 and six second friction disks 68, arranged in an alternating pattern along the shaft 40. As previously discussed, the number of friction disks 62 and 68 may be particularly selected to achieve a desired magnitude of rotational resistance. Specifically, more friction disks 62 and 68 will result in a greater friction force that increases rotational resistance of the armrest lid 36. For example, certain embodiments may include 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, or more first friction disks 62 and a corresponding number of second friction disks 68.

[0029] In the present embodiment, the end cap 76 includes a protrusion 78 disposed within the interior 60 of the cavity 50. As illustrated, the protrusion 78 extends into the recesses 72, thereby blocking rotation of the end cap 76 relative to the armrest lid 36 via contact between the protrusion 78 and the recesses 72. In addition, the shaft 40 includes an opening 80 configured to receive a pin. The pin may serve to hold the end cap 76 against the cavity 50 despite the outward force applied by the spring 74. Furthermore, the pin may serve to block axial movement of the pin 42, thereby holding the pin 42 within the hinge assembly 24. In certain configurations, the pin may be removable such that components within the hinge

assembly 24 may be replaced to alter the rotational resistance of the armrest lid 36.

[0030] FIG. 7 is a cross-sectional view of the hinge assembly 24, taken along line 7-7 of FIG. 4. As illustrated, the protrusions 48 are disposed within the openings 46 of the head 44 of the pin 42, thereby rotationally coupling the pin 42 to the armrest base 34. In addition, the inner protrusions 64 of the first friction disks 62 are disposed within the recesses 66 of the shaft 40, thereby rotationally coupling the first friction disks 62 to the pin 42. As a result, the first friction disks 62 are rotationally coupled to the armrest base 34. Because the second friction disks 68 are rotationally coupled to the armrest lid 36, rotation of the armrest lid 36 is resisted by friction between the friction disks 62 and 68. Consequently, the armrest 22 may remain in a desired position despite vehicle vibrations. Furthermore, because the pin 42 and friction disks 62 and 68 are constructed from light-weight plastic, the hinge assembly 24 may be lighter and less expensive to produce than hinge assemblies employing steel shafts and spring clips.

[0031] FIG. 8 is an exploded view of an embodiment of a detent assembly 82 that may be employed within the hinge assembly of FIG. 4. In the illustrated embodiment, the detent assembly 82 includes a first detent disk 84 configured to rotationally couple to the shaft. Similar to the first friction disk 62, the first detent disk 84 includes two inner protrusions 64 configured to engage two corresponding recesses 66 within the shaft 40, thereby blocking rotation of the disk 84 relative to the shaft. The first detent disk 84 also includes a first detent feature, such as the illustrated axial protrusion 88. In addition, the detent assembly 82 includes a second detent disk 90 rotationally coupled to the passage 60. Similar to the second friction disk 68, the second detent disk 90 includes two outer protrusions 92 configured to engage two corresponding recesses 72 within the passage 60, thereby blocking rotation of the disk 90 relative to the armrest lid 36. The second detent disk 90 also includes a second detent feature, such as the illustrated axial recess 94. As discussed in detail below, contact between the first detent feature 88 and the second detent feature 94 urges the armrest into a detent position.

[0032] In certain embodiments, the detent assembly 82 is disposed about the shaft adjacent to the friction disks. In such embodiments, the force applied by the spring 74 urges the first detent disk 84 against the second detent disk 90. As illustrated, the first detent disk 84 is driven in a direction 96 along an axis 98 extending through the disks 84 and 90. Consequently, when the axial protrusion 88 is aligned with the axial recess 94, the protrusion will be driven into the recess. As a result, a torque applied to the second detent disk 90 in a direction 100 will be resisted by contact between a first angled surface 102 of the axial protrusion 88 and a second angled surface 104 of the axial recess 94. Therefore, while the axial protrusion 88 is disposed within the axial recess 94, the armrest will be in a detent position. However, as

the torque increases, the second angled surface 104 will drive the first angled surface 102 in a direction 106, thereby rotating the second detent disk 90 in the direction 100. While the surfaces 102 and 104 are in contact, the spring force will continue to urge the second detent disk 90 toward the detention position.

[0033] By way of example, the detent assembly 82 may be configured to establish a detent position corresponding to a horizontal orientation of the armrest. In such a configuration, while the armrest is in a horizontal orientation, the axial protrusion 88 will be engaged with the axial recess 94. Rotation of the armrest in an upward direction will be resisted by contact between the first angled surface 102 and the second angled surface 104. However, when a sufficient torque is applied, the first detent disk 84 will be driven in the direction 106, thereby facilitating rotation of the armrest. While the first angled surface 102 is in contact with the second angled surface 104, the armrest will be biased toward the horizontal orientation. However, once the surfaces no longer contact one another, the armrest will rotate freely. It should be appreciated that alternative embodiments may include multiple detent assemblies, establishing multiple detent positions. In addition, a single detent assembly may include multiple protrusions/recesses to provide the armrest with multiple detention positions.

[0034] FIG. 9 is an exploded view of an embodiment of a hinge assembly having a torsion assembly 108 configured to provide rotational resistance. In the illustrated embodiment, the torsion assembly 108 is disposed within a two-part housing 110 that may be coupled to an armrest lid, for example. The torsion assembly 108 includes a pin 112 having a shaft 114 and an integrated disk 116. As discussed in detail below, the integrated disk 116 is configured to block axial movement of the first and second friction disks. In certain embodiments, an end 118 of the pin 112 may include an engagement feature configured to rotationally secure the shaft to a base, such as the armrest base 34.

[0035] As illustrated, the torsion assembly 108 includes multiple first friction disks 62, and multiple second friction disks 68 arranged in an alternating pattern. As previously discussed, the first friction disks 62 include inner protrusions 64 configured to engage a recess 102 within the shaft 114, and the second friction disks 68 include outer protrusions 70 configured to engage a recess within an outer structure. In the illustrated embodiment, the torsion assembly 108 is formed by disposing the friction disks 62 and 68 about the shaft 114, disposing the spring 74 about the shaft adjacent to the disks, and then securing the spring and disks to the shaft with an end cap 122. As illustrated, the end cap 122 includes a radial protrusion 124 configured to engage a recess 126 within the shaft 114. As discussed in detail below, contact between the protrusion 124 and the recess 126 blocks movement of the end cap 122, thereby enabling the spring to compress the disks.

[0036] Once the torsion assembly 108 is formed, the

assembly may be disposed within a passage 128 of the two-part housing 110. As illustrated, the two part housing 110 includes a first portion 130 and a second portion 132, secured to one another by fasteners 134. In the illustrated embodiment, both the first portion 130 and the second portion 132 include recesses 136 configured to receive the outer protrusions 70 of the second friction disks 68. The first and second portions 130 and 132 also include guides 138 configured to support the shaft 114 during operation of the hinge assembly. In certain embodiments, the hinge assembly may be manufactured by forming the torsion assembly 108, and then disposing the torsion assembly 108 within the passage 128 of the first portion 130 such that the outer protrusions 70 of the second friction disks 68 engage the recess 136. The second portion 132 may then be secured to the first portion 130, thereby capturing the torsion assembly. The duration associated with this manufacturing process may be significantly less than processes involving positioning friction disks onto a shaft that is disposed within a cavity.

[0037] FIG. 10 is a cross-sectional view of the hinge assembly, as shown in FIG. 9. As illustrated, the spring 74 compresses the friction disks 62 and 64 between the integrated disk 116 and the end cap 122, thereby establishing the friction force that provides resistance to armrest rotation. In the illustrated embodiment, the radial protrusion 124 of the end cap 122 includes an angled surface that facilitates movement of the end cap 122 toward the integrated disk 116, but blocks movement away from the disk 116. Consequently, during assembly, the end cap 122 may be driven toward the integrated disk 116, thereby compressing the spring 74. Once the radial protrusion 124 is aligned with the recess 126, the end cap 122 will be secured to the shaft 114, thereby forming the torsion assembly 108.

[0038] While only certain features and embodiments of the invention have been illustrated and described, many modifications and changes may occur to those skilled in the art (e.g., variations in sizes, dimensions, structures, shapes and proportions of the various elements, values of parameters (e.g., temperatures, pressures, etc.), mounting arrangements, use of materials, colors, orientations, etc.) without materially departing from the novel teachings and advantages of the subject matter recited in the claims. The order or sequence of any process or method steps may be varied or re-sequenced according to alternative embodiments.

Claims

1. A vehicle interior trim component having a hinge assembly, said hinge assembly comprising:
 - a rotatable component, comprising an armrest;
 - a shaft (114) disposed through the rotatable component;
 - a first friction disk (62) rotationally coupled to

the shaft (114);

- a second friction disk (68) rotationally coupled to the rotatable component; and
 - a biasing member (74) configured to urge the first and second friction disks (62, 68) toward one another to establish a friction force that provides resistance to rotation of the rotatable component about the shaft (114), **characterized in that** the hinge assembly comprises an end cap (122) configured to retain the first and second friction disks (62, 68), wherein the end cap (122) comprises a radial protrusion (124) configured to engage a recess (126) within the shaft (114) to secure the end cap (122) to the shaft (114),

wherein the shaft (114) comprises a recess (126) and the first friction disk (62) comprises an inner protrusion (64) configured to engage the recess (126) to rotationally couple the first friction disk (62) to the shaft (114), wherein the rotatable component comprises a passage, and the shaft (114) passes through the passage to facilitate rotation of the rotatable component, and wherein the shaft (40, 114) and the friction disks (62, 68) are constructed from plastic.

2. The vehicle interior trim component of Claim 1 wherein the passage comprises a recess and the second friction disk (68) comprises an outer protrusion (70) configured to engage the recess to rotationally couple the second friction disk (68) to the rotatable component.
3. The vehicle interior trim component of one of Claim 1 or 2 wherein the hinge assembly comprises a plurality of first friction disks (62) and a plurality of second friction disks (68), wherein the first and second friction disks (62, 68) alternate along the shaft.
4. A method of manufacturing a vehicle interior trim component according to one of Claims 1 to 3, comprising:

- forming a torsion assembly by rotationally coupling a first friction disk (62) to a shaft (114), disposing a second friction disk (68) about the shaft (114) adjacent to the first friction disk (62), and biasing the first and second friction disks (62, 68) toward one another to establish a friction force; and
 - disposing the torsion assembly within a passage of a rotatable component such that an outer protrusion (70) of the second friction disk (68) engages a recess of the rotatable component to rotationally couple the second friction disk (68) to the rotatable component, wherein the friction force provides resistance to rotation of the rotatable component about the shaft (114).

Patentansprüche

1. Fahrzeuginnenverkleidungsteil mit einer Gelenkanordnung, wobei die Gelenkanordnung Folgendes aufweist:

- eine drehbare Komponente, die eine Armlehne aufweist;
 - eine Welle (114), die durch die drehbare Komponente angeordnet ist;
 - eine erste Reibscheibe (62), die drehbar mit der Welle (114) verbunden ist;
 - eine zweite Reibscheibe (68), die drehbar mit der drehbaren Komponente verbunden ist; und
 - ein Vorspannelement (74), das dazu ausgebildet ist, die erste Reibscheibe und die zweite Reibscheibe (62, 68) zueinander zu drängen, um eine Reibungskraft zu erzeugen, die einen Drehwiderstand der drehbaren Komponente um die Welle (114) bereitstellt,

dadurch gekennzeichnet, dass die Gelenkanordnung eine Endkappe (122) aufweist, die dazu ausgebildet ist, die erste und zweite Reibscheibe (62, 68) zu halten, wobei die Endkappe (122) einen radialen Vorsprung (124) aufweist, der dazu ausgebildet ist, in eine Ausnehmung (126) innerhalb der Welle (114) einzugreifen, um die Endkappe (122) an der Welle (114) zu befestigen, wobei die Welle (114) eine Ausnehmung (126) aufweist und die erste Reibscheibe (62) einen inneren Vorsprung (64) aufweist, der dazu ausgebildet ist, mit der Ausnehmung (126) in Eingriff zu kommen, um die erste Reibscheibe (62) drehbar mit der Welle (114) zu verbinden, wobei die drehbare Komponente einen Durchgang aufweist, und wobei die Welle (114) durch den Durchgang verläuft, um die Drehung der drehbaren Komponente zu erleichtern, und
 wobei die Welle (40, 114) und die Reibscheiben (62, 68) aus Kunststoff hergestellt sind.

2. Fahrzeuginnenverkleidungsteil gemäß Anspruch 1, wobei der Durchgang eine Aussparung aufweist und die zweite Reibscheibe (68) einen äußeren Vorsprung (70) aufweist, der dazu ausgebildet ist, mit der Aussparung in Eingriff zu kommen, um die zweite Reibscheibe (68) drehbar mit der drehbaren Komponente zu verbinden.
3. Fahrzeuginnenverkleidungsteil gemäß Anspruch 1 oder 2, wobei die Gelenkanordnung eine Vielzahl von ersten Reibscheiben (62) und eine Vielzahl von zweiten Reibscheiben (68) aufweist, wobei die ersten und zweiten Reibscheiben sich entlang der Welle abwechseln.
4. Verfahren zum Herstellen eines Fahrzeuginnenver-

kleidungsteils gemäß einem der Ansprüche 1 bis 3, das folgende Schritte aufweist:

- Ausbilden einer Torsionsanordnung durch drehbares Befestigen einer ersten Reibscheibe (62) mit einer Welle (114), durch Anordnen einer zweiten Reibscheibe (68) um die Welle (114) herum und benachbart zu der ersten Reibscheibe (62), und durch Vorspannen der ersten und zweiten Reibscheibe (62, 68) zueinander, um eine Reibungskraft zu erzeugen; und
- Anordnen der Torsionsanordnung innerhalb eines Durchgangs einer drehbaren Komponente derart, dass ein äußerer Vorsprung (70) der zweiten Reibscheibe (68) mit einer Ausnehmung der drehbaren Komponente in Eingriff kommt, um die zweite Reibscheibe (68) mit der drehbaren Komponente zu verbinden, wobei die Reibungskraft einen Drehwiderstand der drehbaren Komponente um die Welle (114) bereitstellt.

Revendications

1. Composant de garniture d'intérieur de véhicule ayant un assemblage à charnière, ledit assemblage à charnière comprenant :

- un composant rotatif, comprenant un accoudeur ;
- un axe (114) disposé à travers le composant rotatif ;
- un premier disque de friction (62) couplé en rotation à l'axe (114) ;
- un deuxième disque de friction (68) couplé en rotation au composant rotatif ; et
- un élément de sollicitation (74) configuré pour pousser les premier et deuxième disques de friction (62, 68) l'un en direction de l'autre afin d'établir une force de friction qui oppose une résistance à la rotation du composant rotatif autour de l'axe (114),

caractérisé en ce que

l'assemblage à charnière comprend un cache terminal (122) configuré pour retenir les premier et deuxième disques de friction (62, 68), dans lequel le cache terminal (122) comprend une projection radiale (124) configurée pour engager un renforcement (126) à l'intérieur de l'axe (114) pour fixer le cache terminal (122) à l'axe (114), dans lequel l'axe (114) comprend un renforcement (126) et le premier disque de friction (62) comprend une projection intérieure (64) configurée pour engager le renforcement (126) afin de coupler le premier disque de friction (62) à l'axe (114), dans lequel le composant rotatif comprend un pas-

sage, et l'axe (114) passe à travers le passage pour permettre la rotation du composant rotatif, et dans lequel l'axe (40, 114) et les disques de friction (62, 68) sont fabriqués en matière plastique.

2. Composant de garniture d'intérieur de véhicule selon la revendication 1, dans lequel le passage comprend un renforcement et le deuxième disque de friction (68) comprend une projection extérieure (70) configurée pour engager le renforcement afin de coupler en rotation le deuxième disque de friction (68) au composant rotatif.
3. Composant de garniture d'intérieur de véhicule selon l'une des revendications 1 ou 2, dans lequel l'assemblage à charnière comprend une pluralité de premiers disques de friction (62) et une pluralité de deuxième disques de friction (68), dans lequel les premiers et deuxième disques de friction (62, 68) alternent le long de l'axe.
4. Procédé de fabrication d'un composant de garniture d'intérieur de véhicule selon l'une des revendications 1 à 3, comprenant les étapes consistant à :

- former un assemblage de torsion en couplant en rotation un premier disque de friction (62) à un axe (114), disposer un deuxième disque de friction (68) autour de l'axe (114) de manière adjacente au premier disque de friction (62), et solliciter les premier et deuxième disques de friction (62, 68) l'un en direction de l'autre afin d'établir une force de friction; et
- disposer l'assemblage de torsion à l'intérieur d'un passage d'un composant rotatif de manière qu'une projection extérieure (70) du deuxième disque de friction (68) engage un renforcement du composant rotatif afin de coupler en rotation le deuxième disque de friction (68) au composant rotatif, dans lequel la force de friction oppose une résistance à la rotation du composant rotatif autour de l'axe (114).

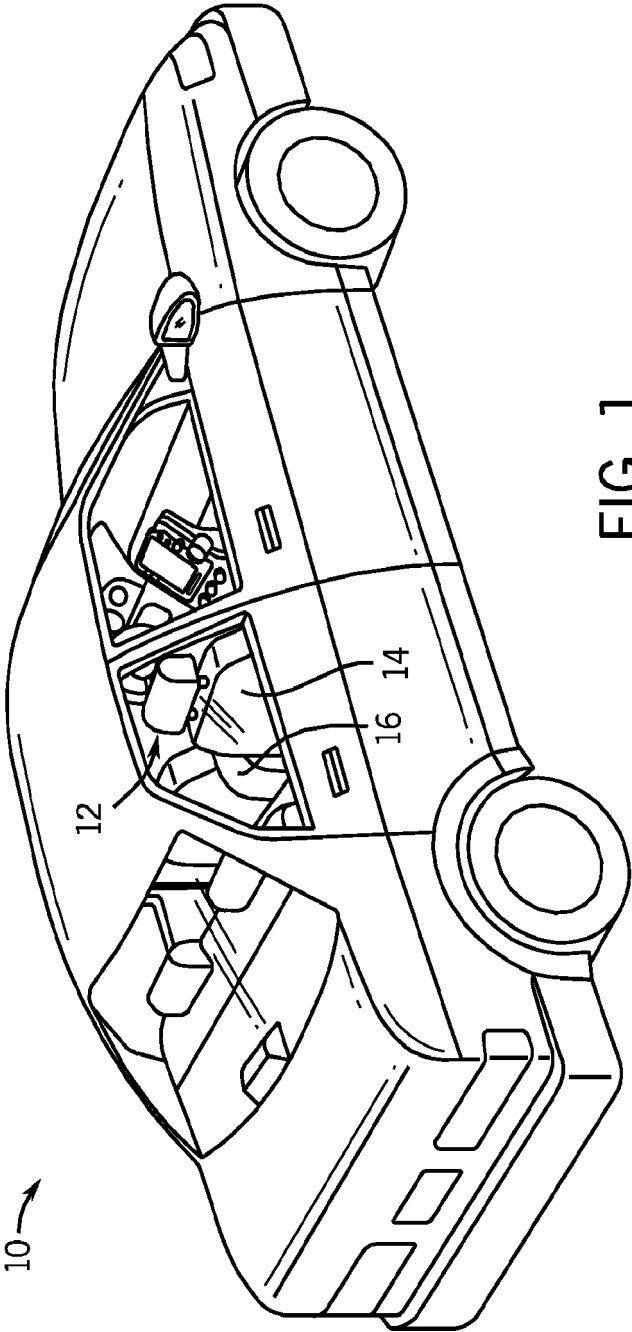


FIG. 1

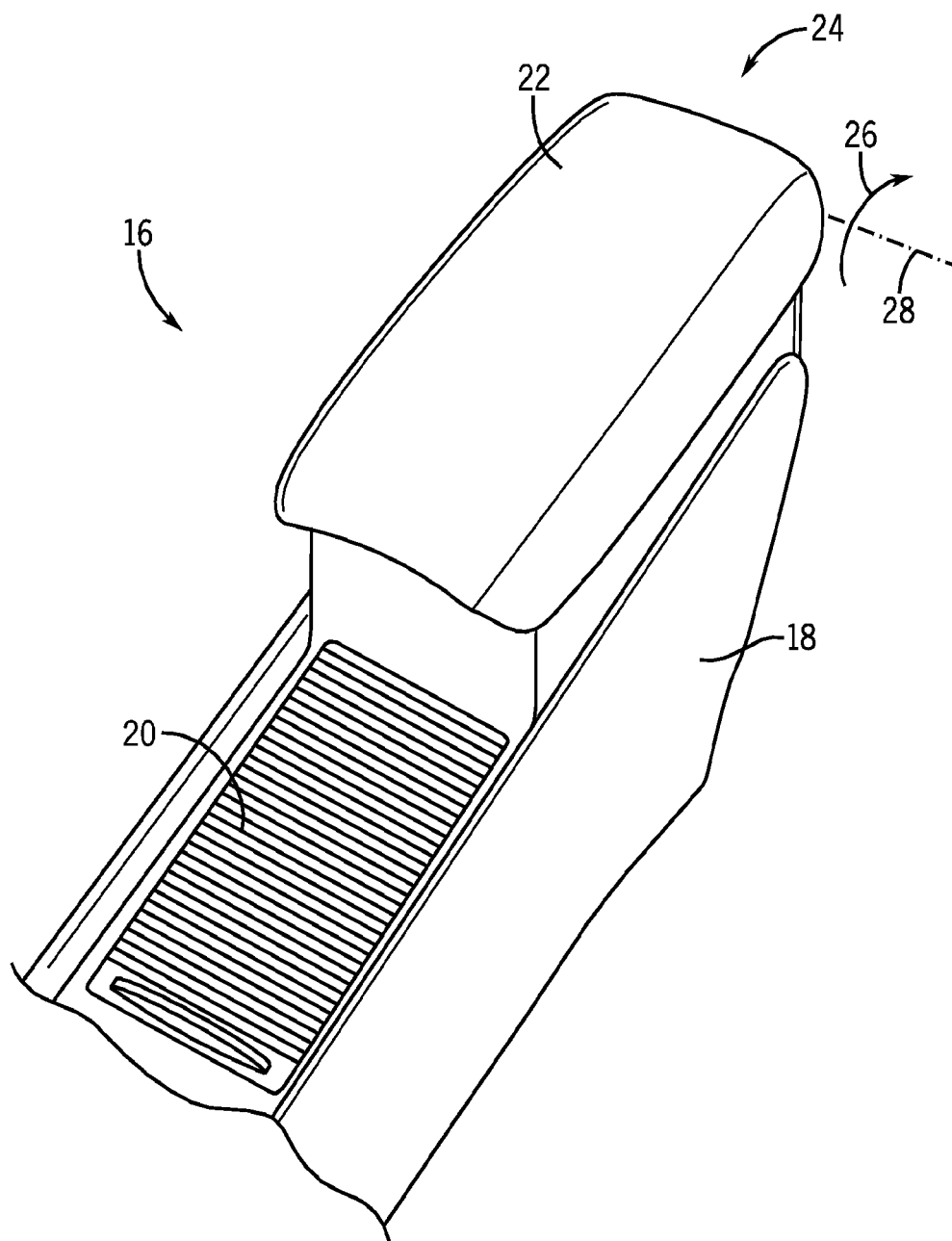


FIG. 2

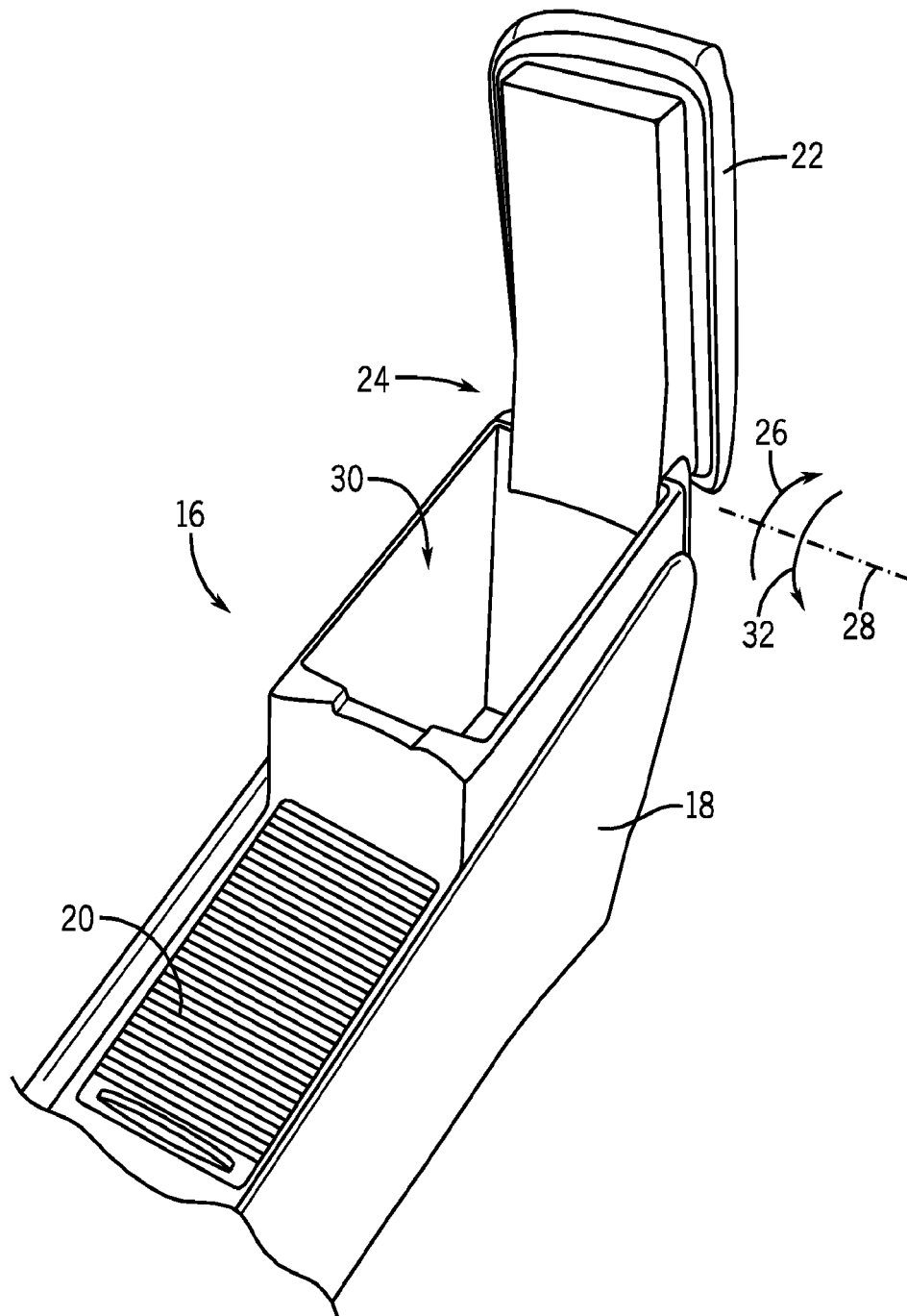


FIG. 3

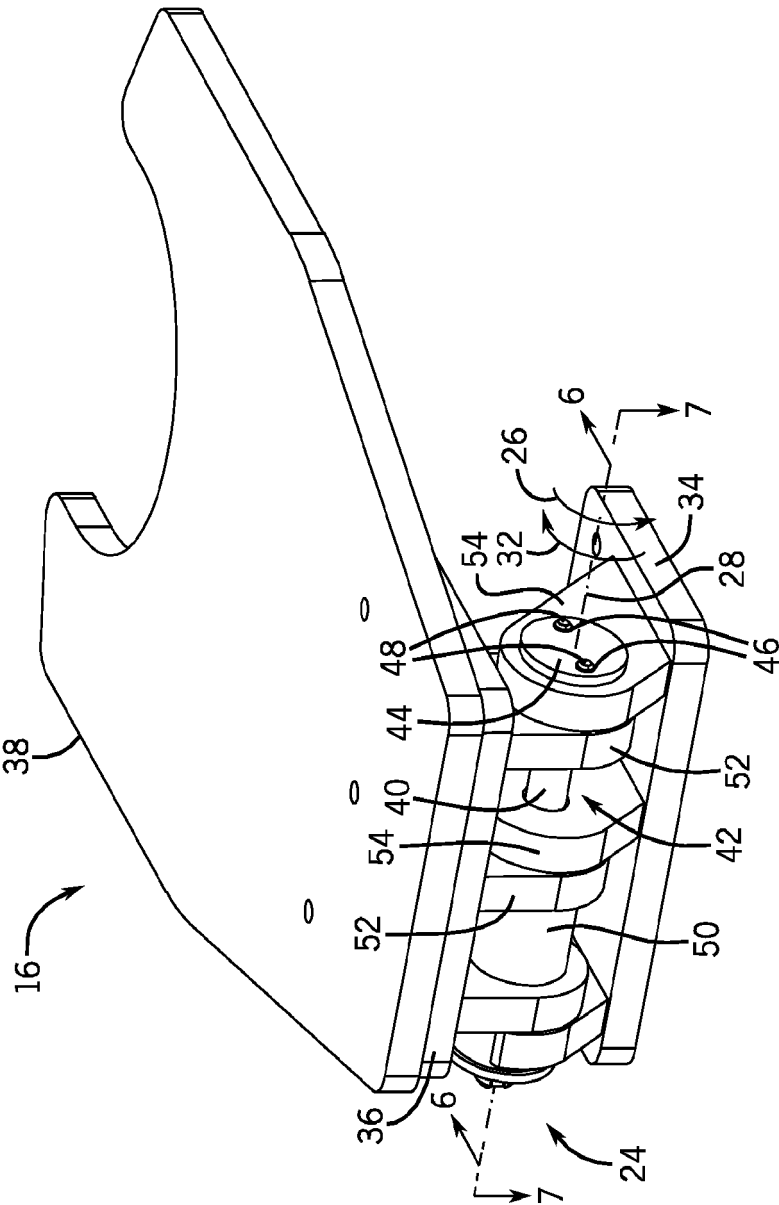


FIG. 4

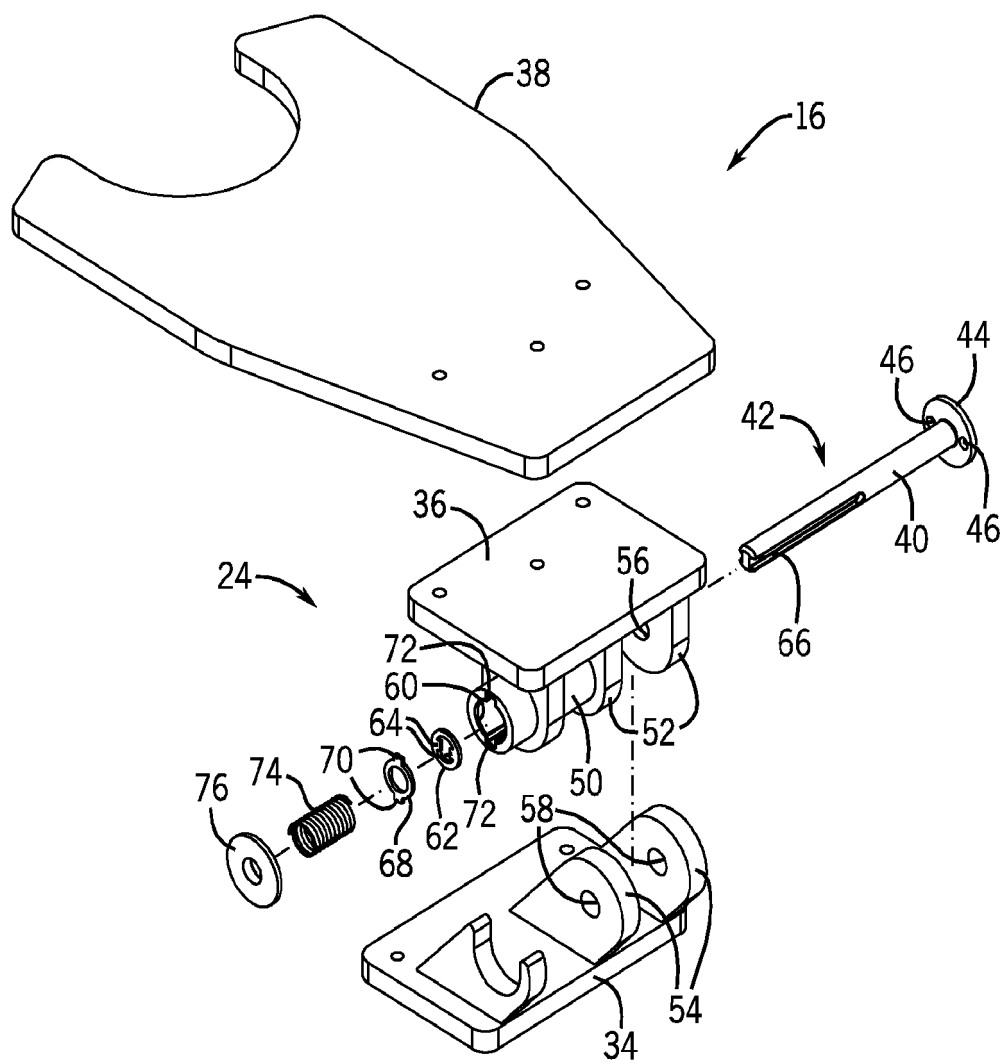


FIG. 5

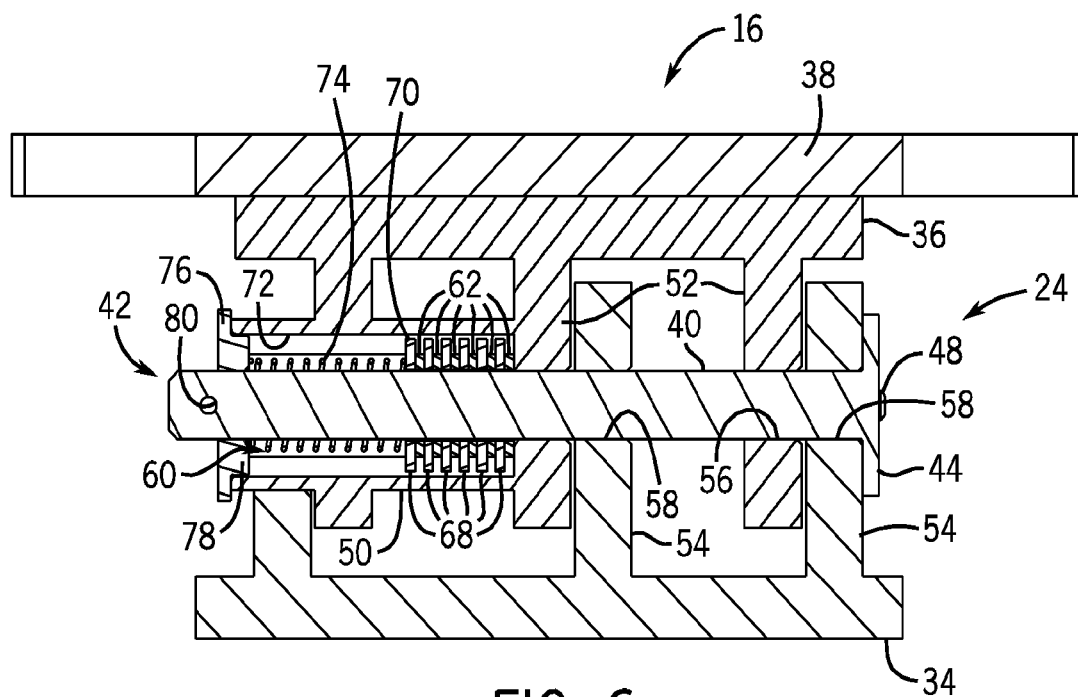


FIG. 6

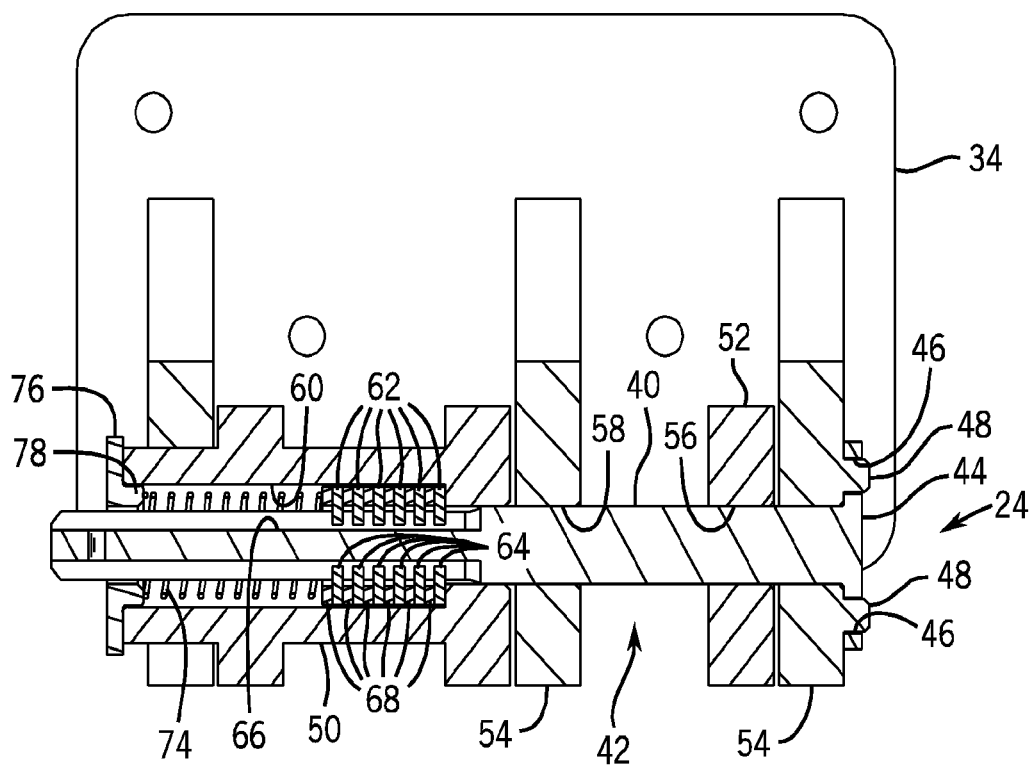


FIG. 7

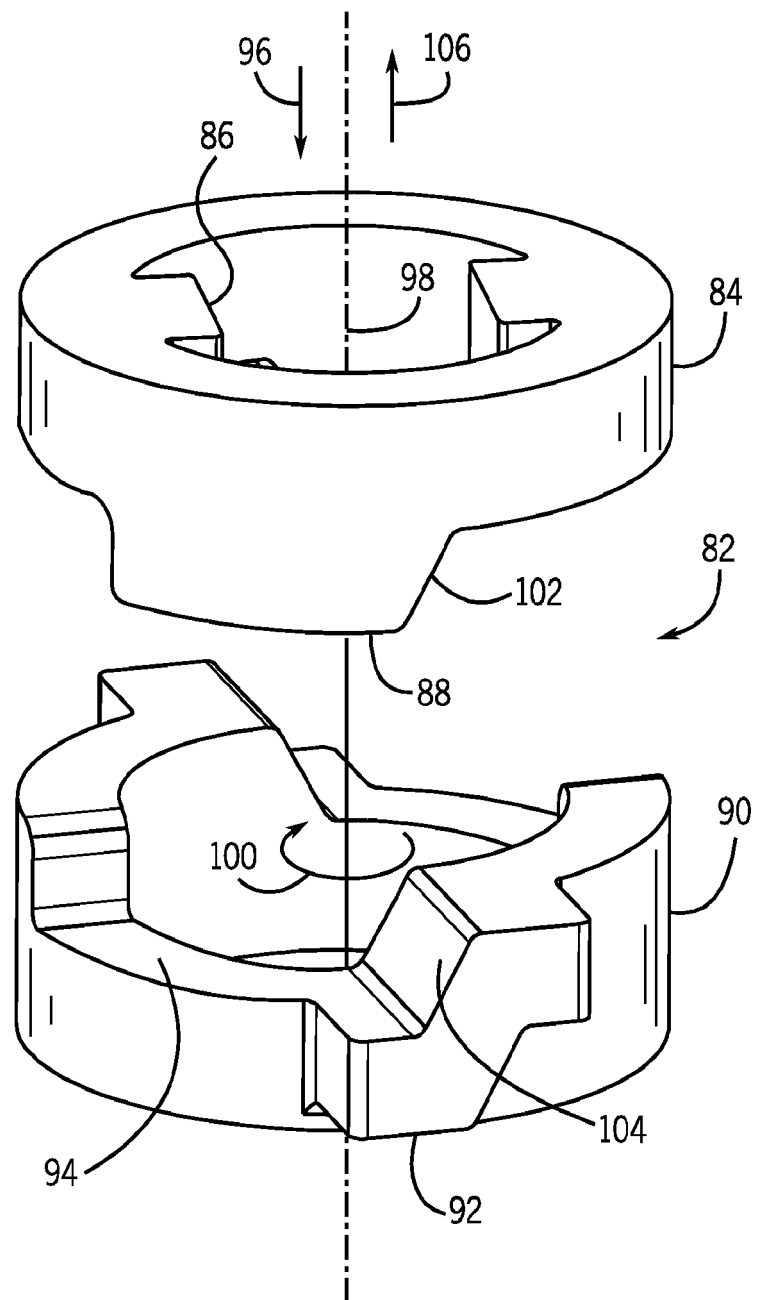


FIG. 8

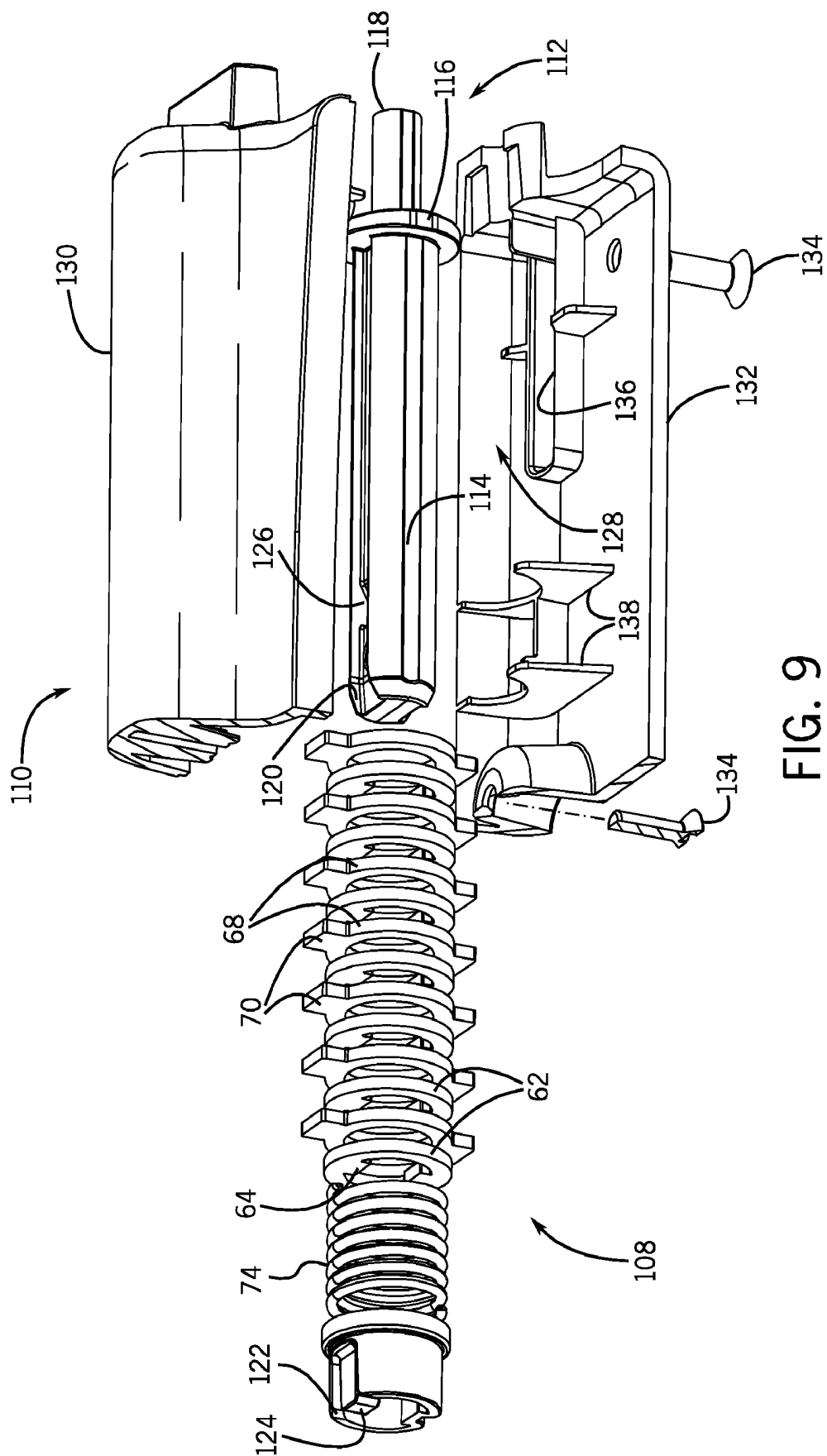


FIG. 9

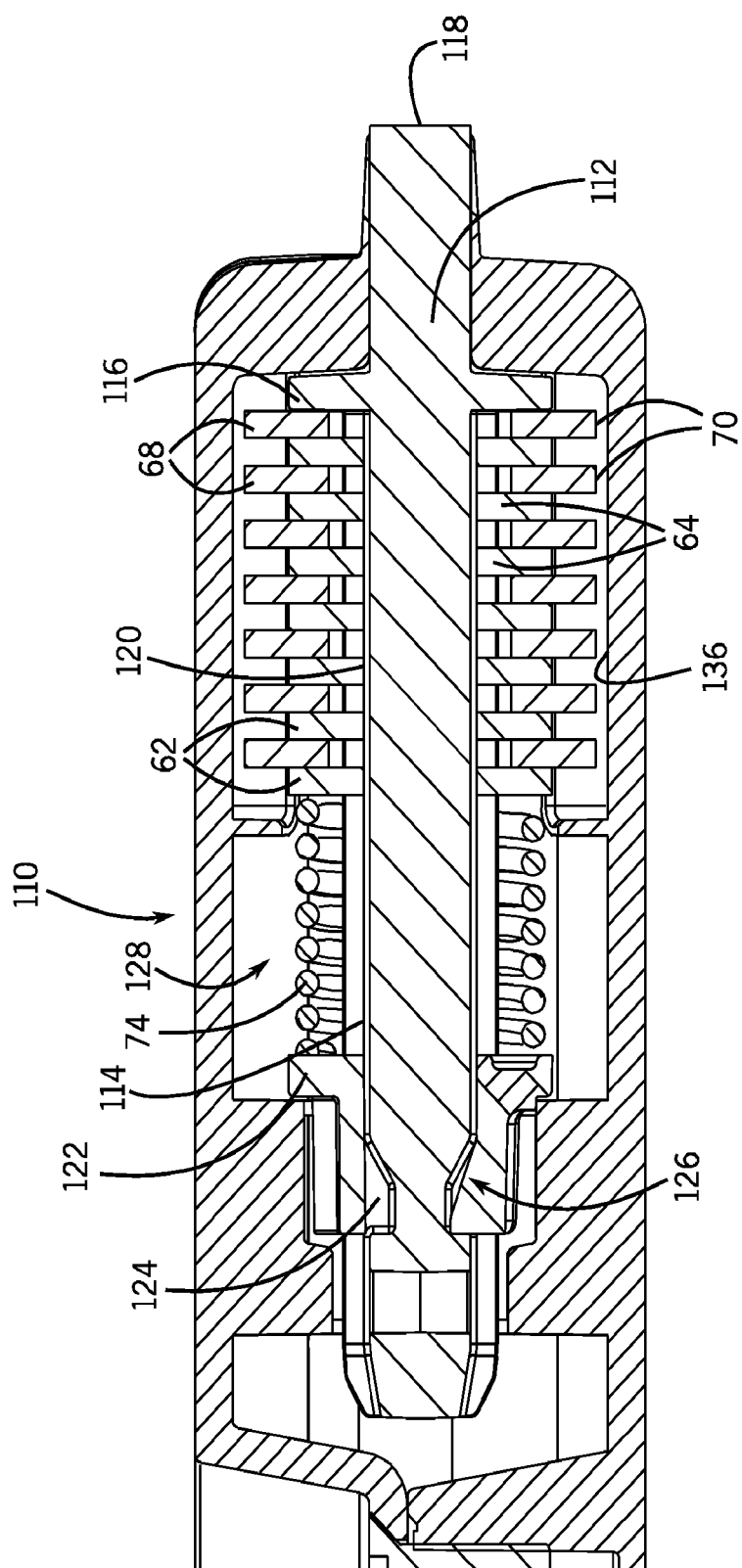


FIG. 10

REFERENCES CITED IN THE DESCRIPTION

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